REMARKS/ARGUMENTS:

Claims 1-23 are pending in this Application. In a non-final Office Action dated January 21, 2005, the Examiner has asserted the following claims rejections: claim 1 is rejected as anticipated by Park (US 5,537,430); claims 3 and 10 are rejected as obvious over Park in view of Ramchandran (US 5,267,021); claim 11 is rejected as obvious over McCallister (US 6,097,764) in view of Park; claims 13 and 20 are rejected over McCallister in view of Ramchandran; and claim 21 is rejected as obvious over Ramchandran in view of Park.

The Office Action further asserts that claims 2, 4-9, 12, 14-19, and 22-23 are objected to for their dependency from a rejected base claim, but would be allowable if rewritten in independent form including all limitations of base and intervening claims.

Method claims 2 and 7 are re-written as independent claims, incorporating all elements of base claim 1 from which they previously depended. Method claim 4 is rewritten to include all elements of base claim 1 and intervening claim 3 from which it previously depended. Claims 5 and 6 depend from claims 4 and 5 respectively, and claims 8 and 9 depend from claims 7 and 8 respectively, so each of claims 2 and 4-9 should now be in condition for allowance.

Apparatus claims 12 and 17 are re-written as independent claims, incorporating all elements of base claim 11 from which they previously depended. Apparatus claim 14 is rewritten to include all elements of base claim 11 and intervening claim 13 from which it previously depended. Claims 15 and 16 depend from claims 14 and 15 respectively, and claims 18 and 19 depend from claims 17 and 18 respectively, so each of claims 12 and 14-19 should now be in condition for allowance.

Method claim 22 is re-written as an independent claim, incorporating all elements of base claim 21 from which it previously depended. Claim 23 depends from claim 22, so each of claims 22-23 should now be in condition for allowance.

Rejection under 35 USC 102:

Claim 1 recites that at least two constellation points within the selected subset are separated from one another by a distance based on a conditional distribution. Against this

element, the Office Action cites Park at col. 1, line 38, which recites: "...input data is encoded to maximize the euclidean distance between symbols...". A Euclidean distance is that geometric distance between points whose positions are fixed in space, whereas a distance based on a conditional distribution is explicitly described at page 5, line 31 to page 6, line 2 of the written description. A distance between two points, at least one of whose location is characterized by, e.g., a probability density function rather than a discrete spatial position, is a distance based on a conditional distribution. If the position of both points is known absolutely, there is no conditional distribution; their locations are fixed with certainty. Said another way, the Euclidean distance between two points may be said, with 100% certainty, to span a distance x; a distance based on a conditional distribution between two points cannot be said with 100% certainty to be a particular value, and the amount of uncertainty depends from the underlying conditional distribution. In the conditional distribution is a probability density function as suggested in the written description, the location of at least one point may be considered the weighted probabilistic center of a distribution of possible locations for that constellation point. In such a case, the location of the point is "known" as being at the distribution's probabilistic center only within a confidence level that is less than 100%. Park discloses only a Euclidean distance between points of a signal constellation, which necessarily implies points whose positions are known absolutely. Claim 1 is therefore seen as novel over Park.

Rejection under 35 USC 103:

Claims 3 and 10 are rejected over Park and Ramchandran. These claims depend from claim 1, which distinguishes over Park as above. Ramchandran is not seen to teach or suggest that a distance between constellation points may be based on a conditional distribution. While Ramchandran is not seen to explicitly disclose "Euclidean" distance as Park does, Ramchandran is seen to use the term "distance" without modifier. It is asserted that the term distance generally refers to Euclidean distance. One skilled in the art would not find motivation to modify the "Euclidean distance" of Park or the "distance" of Ramchandran between constellation points, because neither reference teaches or suggests anything other than a Euclidean distance. As Park explicitly recites Euclidean distance, any teaching in another reference must be specific as to a different distance measure, and the requisite motivation must be sufficient overcome that explicit teaching of Park.

Ramchandran is not seen to provide such a specific teaching or compelling motivation, so claims 3 and 10 should also be patentable.

Claim 11 recites, for an apparatus, the same clause "distance based on a conditional distribution" as noted above respecting method claim 1. Claim 11 is rejected over McCallister and Park, for which only Park is cited against the above-reproduced clause relating to distance. Both Park and McCallister explicitly recite Euclidean distance between constellation points, and neither suggests an alternative to Euclidean geometry to set the distance between points. Claim 11 is therefore seen as not obvious over the combination.

Claims 13 and 20 depend from claim 11, and are rejected over McCallister and Ramchandran. None of Park, McCallister, or Ramchandran, alone or in combination, is seen to teach or suggest the distance recited in claim 11, so these claims are seen to be patentable.

The Office Action does not specifically recite which of Park or Ramchandran teaches or suggests the element "distance based on a conditional distribution" of claim 21. As detailed above with respect to claims 1, 3 and 10, neither Park nor Ramchandran, alone or in combination, is seen to disclose, teach or suggest this aspect of distance between points of a signal constellation, so claim 21 is seen as patentable over the art.

In light of the above arguments and claim amendments, the Applicant requests the Examiner to reconsider and withdraw the claim objections and rejections, and pass each of claims 1-22 to issue. The undersigned welcomes the opportunity to resolve any matters, formal or otherwise, via teleconference at the Examiner's discretion.

Respectfully submitted:

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